

What we claim is:

1           1. A hybrid electric vehicle power generation system, comprising:  
2           a turbogenerator/motor;  
3           a DC bus;  
4           a first power converter connecting said turbogenerator/motor and said DC bus, said first  
5 power converter serving as a AC to DC converter when power is supplied from said  
6 turbogenerator/motor to said DC bus and as an DC to AC converter when power is supplied from  
7 said DC bus to said turbogenerator/motor during start up and operation of said  
8 turbogenerator/motor;  
9           a hybrid electric vehicle energy storage device;  
10           a second power converter connecting said hybrid electric vehicle energy storage device  
11 and said DC bus, said second power converter transferring power between said DC bus and said  
12 hybrid electric vehicle energy storage device;  
13           said first and said second power converters together serving as a power controller to  
14 provide a distributed generation power system to regulate said DC bus to a desired voltage  
15 independent of turbogenerator/motor speed.

1           2. The turbogenerator/motor control system of claim 1 wherein said  
2 turbogenerator/motor is a permanent magnet turbogenerator/motor.

1           3. The turbogenerator/motor control system of claim 1 and in addition,  
2 a resistive load connected across said DC bus to dissipate power from said DC bus  
3 whenever said DC bus exceeds the desired voltage.  
4

5           4. The turbogenerator/motor control system of claim 1 wherein said hybrid electric  
6 vehicle energy storage device is a battery.

7           5. The turbogenerator/motor control system of claim 1 wherein said hybrid electric  
8 vehicle energy storage device is a flywheel.

1           6. The turbogenerator/motor control system of claim 1 wherein said hybrid electric  
2 vehicle energy storage device is an ultracapacitor.

1           7. The turbogenerator/motor control system of claim 4 wherein said power controller  
2 includes means to detect transients associated with said turbogenerator/motor and said hybrid  
3 electric vehicle battery.

1           8. A hybrid electric vehicle power generation system, comprising:  
2           a DC bus;  
3           a permanent magnet turbogenerator/motor;  
4           a hybrid electric vehicle battery;  
5           a power controller to provide a distributed generation power system to regulate said DC  
6 bus to a desired voltage independent of permanent magnet turbogenerator/motor speed, said  
7 power controller having  
8           a first power converter connecting said permanent magnet turbogenerator/motor and said DC bus  
9           serving as a AC to DC converter when power is supplied from permanent magnet  
10           turbogenerator/motor to said DC bus and as a DC to AC converter when power is supplied from  
11           said DC bus to said permanent magnet turbogenerator/motor during start up and operation of said  
12           permanent magnet turbogenerator/motor, a second power converter connecting said hybrid  
13           electric vehicle battery and said DC bus serving as a DC to DC converter when power is supplied  
14           from said DC bus to said hybrid electric vehicle battery and as a reverse DC to DC converter

15 when power is supplied from said hybrid electric vehicle battery to said DC bus, and means to  
16 detect transients associated with any of said permanent magnet turbogenerator/motor and said  
17 hybrid electric vehicle battery; and  
18 a resistive load connected across said DC bus to dissipate power from said DC bus  
19 whenever said DC bus exceeds the desired voltage.

15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 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